**INTRODUCTION:** One important phonological observation is that constraints on output structures can both block and trigger phonological processes (Kisseberth 1970 *et seq*). The OCP, which prohibits adjacent identical segments/features, is a prime example: McCarthy (1986) argued that the OCP can block otherwise productive syncope processes, and Yip (1988) further claimed that the OCP can trigger phonological processes in order to avoid adjacent identical segments. This observation led to the development of constraint-based theories, most notably Optimality Theory (Prince & Smolensky 2004). This paper reports an experiment which shows that an identity avoidance constraint both block and trigger one phonological process in the same language, namely Rendaku in Japanese.

**BACKGROUND:** Rendaku is a process where the initial consonant of the second member of compounds becomes voiced, as in /oo+\texttt{tako}/ $\Rightarrow$ [oodako] "big octopus". Not all compounds undergo this voicing process, however, and there are many phonological and morphological conditions that affect the likelihood of Rendaku application (e.g. Itô & Mester 1986; Kubozono 2005; Lyman 1894; Rosen 2003; Vance, to appear). One famous example is Lyman's Law (or OCP[voice]), where Rendaku is blocked when the second member of a compound already contains a voiced obstruent; e.g. /oo+\texttt{tokage}/ $\Rightarrow$ [oo+\texttt{tokage}], *[oo+\texttt{dokage}] "big lizard".

Our nonce-word experiment identifies another kind of OCP effect on the applicability of Rendaku. It shows that Rendaku is more likely to apply when the two consonants across a morpheme boundary are identical (i.e. *[C\textsubscript{i}(V)+C\textsubscript{i}]*); i.e. an identity avoidance constraint triggers Rendaku. The experiment also shows that Rendaku is less likely to apply when it would result in two adjacent identical consonants across a morpheme boundary (i.e. /C\textsubscript{i}V+C\textsubscript{k}/ $\Rightarrow$ *[C\textsubscript{i}(V)+C\textsubscript{i}]*); i.e. the identity avoidance constraint blocks Rendaku.

**METHOD:** The current experiment used wug-tests to examine the effect of identity avoidance on Rendaku. The participants were given a real noun and a nonce noun, and were asked to choose the best resulting compounding form. For example, they were asked: given [ika] "squid" and [kaniro] (nonce), what would be the better outcome, [ika\texttt{kaniro}] or [ik\texttt{aganiro}]? In the first stimulus set, in one condition, the two consonants across the morpheme boundary were identical (i.e. *[i\texttt{ka}(V)+k\texttt{aniro}]]); whereas in the other condition, they were not identical (e.g. [i\texttt{ka}]+[\texttt{kaniro}]).

In the second stimulus set, in one condition, the two consonants across the morpheme boundary were identical except for voicing (e.g. [i\texttt{ga}]+[\texttt{kaniro}]); therefore, in this condition, Rendaku would result in two adjacent identical consonants (i.e. [i\texttt{ga}]+[\texttt{ganiro}]). In the other condition, the first obstruent was a voiced stop, but differed in place or manner with the second consonant (e.g [i\texttt{ga}]+[\texttt{taniro}]); thus, Rendaku would not result in two identical consonants.

For both stimulus sets, the stimuli included second nouns with all the consonants that can potentially undergo Rendaku ([t, k, s, h]), and 3 different nonce words for each consonant.

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set also included 4 types of first nouns. Therefore, each block included 48 test items (4 N1 * 4 N2 * 3 lexical sets). The order of the stimuli was randomized per participant within each block. 39 native speakers of Japanese participated in this study.

**Results:** Figure 1 shows the probability of Rendaku application for the first stimulus set. The left bar represents the condition in which the two consonants across a morpheme boundary were identical, while the second bar represents the condition in which the two consonants were not identical. We observe that Japanese speakers applied Rendaku more often to avoid two adjacent identical segments. A logistic linear mixed model analysis (Jaeger 2008) shows that this difference is statistically significant ($z=2.04, p<.05$).

![Figure 1: The effect of identity avoidance on triggering Rendaku. Error bars=95% CIs.](image1)

![Figure 2: The effect of identity avoidance on blocking Rendaku. Error bars=95% CIs.](image2)

Figure 2 shows the results of the second stimulus set. We observe that Rendaku is less likely for cases in which Rendaku would result in two identical segments ($z=6.15, p<.001$).

**Discussion** Our experiment demonstrates that the identity avoidance constraint both triggers (Figure 1) and blocks Rendaku (Figure 2) in order to avoid adjacent identical consonants across a morpheme boundary. The effect of avoiding of two voiced obstruents on Rendaku is well known as Lyman's Law (Lyman 1984; Itô & Mester 1986 *et seq.*), but to the best of our knowledge, the effect of the general identity avoidance constraint is a new discovery.

In addition to this new descriptive discovery in Japanese, this study offers two general theoretical implications. One is that the current result constitutes a new case of conspiracy (Kisseberth 1970) and homogeneity of target (McCarthy 2001). Therefore, it supports the importance of output constraints—in our case, a ban on adjacent identical consonants—in phonological theory, as emphasized in Optimality Theory (Prince and Smolenksy 1993). Second, the effect of identity avoidance constraint in Rendaku has not been known, although Rendaku has been studied extensively in the literature. Our project thus demonstrates that an experiment can reveal an aspect of a phonological process which would be otherwise difficult to assess.